Space Weather Forecast

Issued on Wednesday, 06 April 2022 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate G1/G2 geomagnetic storm likely on day 2 (6th April) from 03 April Coronal Mass Ejection (CME) with a slight chance of a G3 Strong storm. Possible glancing blow from another CME on Day 4 (9th April).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours with several minor common-class flares.

There are currently up to six sunspots on the sun, four numbered, two unnumbered. The largest region on the sun currently lies near the middle of the Earth facing side, but this has remained relatively subdued despite its size. To its immediate south, a smaller bipolar group showed a declining trend, while the remaining four groups are small, unipolar and stable.

At 04/2113 UTC a filament eruption occurred in the south central portion of the sun, with this event visible in extreme UV satellite imagery as well as near infrared ground-based telescopes. This event was tied to a small common-class flare, which has been analysed and shows an Earth-directed coronal mass ejection (CME), which may give a glancing blow at Earth on Day 4 (9th April). This may give a slight chance of a G1/minor storm.

Solar Wind / Geomagnetic Activity: The solar wind eased through the period due to waning coronal hole influences. The number of particles in the solar wind and their associated magnetic field were both unremarkable and within normal background limits. The magnetic field was weak. The net result of the above solar wind measures was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: Solar radiation levels showed a continuing gradual relaxation towards background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity should be predominantly low, with relatively fewer and less complex active regions on the visible side of the sun than of late.

Solar Wind / Geomagnetic Activity: The current declining fast wind is the only one in the forecast, and an exit to a slow wind regime is expected later on day 1 (5th April), with geomagnetic activity then largely quiet in the absence of CME(s).

There is one confirmed CME in the forecast at present, that from the 03/1500 UTC 'filament eruption' (arc of plasma leaving the sun). This is due to arrive around 06/1800 UTC, with the likely result of a Minor or Moderate G1/G2 geomagnetic storm intervals and slight chance of a G3 Strong storm, perhaps continuing into the start of day 3 (7th April). Activity easing back to Quiet on day 4 (8th April).

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In addition to this confirmed CME, a second centre-disc filament eruption observed to peak around 04/2100 UTC. Analysis shows this CME arriving at Earth on Day 4 (9th April), which may give a G1/minor storm.

Energetic Particles / Solar Radiation: The risk of further solar radiation storms should now slowly reduce as last week's highly active northwestern sunspot regions rotate further onto the far side. The residual risk from current front side groups is much lower given their quiet behaviour.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	30	1	40
Strong	G3	No	5	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5

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Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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